



US Doubler

For Atari 1050 Disk Drive

Installation required
Complete instructions provided



USD 1-4

US Doubler

**UltraSpeed Double
Density Enhancement for
Atari 1050 Disk Drives**

by ICD

Note—throughout this manual:

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CHAPTER 1—US DOUBLER OPERATION

Introduction

The US Doubler is a high quality enhancement chip set for the Atari 1050 disk drive. Many man hours have been spent to make this product easy to install and to provide your 1050 with intelligent single, dual, and double density operation. The US Doubler is an original, innovative product developed by ICD, Inc., not just a poor copy of someone else's product like some other density doublers.

After installation, your US Doubler 1050 will be fully compatible with the single and dual density software which you have used before, as well as full double density operation with programs which support that mode.

UltraSpeed Operation

SpartaDOS, also developed by ICD, Inc., is the recommended DOS to use with the US Doubler since it opens up the UltraSpeed operation. (Without SpartaDOS, your US Doubler enhanced 1050 will run at normal speed.) This high speed data transfer is accomplished by increasing the SIO baud rate from 19.2K to 54K. The UltraSpeed sector skew then allows 3 times as many sector reads for each revolution of the disk resulting in rapid I/O which sounds like machine gun fire.

Possible Problems with UltraSpeed and the 130XE

Some 130XE computers have been found which don't like the 54K baud rate and they seem to sputter when reading a sector in UltraSpeed. The solution for this problem is to remove the band width limiting capacitor on the data out line inside your computer. This capacitor (which looks like a diode) will be connected from pin 5 of the 13 pin SIO connector of the 130XE to ground. All you need to do is cut one end of the capacitor and bend it away from the rest. (When facing the back of the computer, pin 5 is in the bottom row, the third pin from the left.) You will notice that each pin on this connector has these capacitors going to ground. The purpose is to filter out a small amount of high frequency noise which may affect television reception. The intention was good but the capacitor on pin 5 also filters out high speed data.

NOTE: The newest 130XEs no longer have these capacitors soldered directly to the connector. Instead, they have them properly laid out on the circuit board to the lower right of the I/O connector. The capacitor you need to cut is C304.

SpartaDos Availability

SpartaDOS is available on disk as part of the SpartaDOS Construction Set for \$39.95 retail or in the SpartaDOS X cartridge (hardware version) for \$79.95 retail. See your dealer or call ICD direct for further information.

CHAPTER 2—US DOUBLER INSTALLATION

Brief Overview

The US Doubler consists of two plug in modules which are to be installed in your Atari 1050 disk drive. One of these is a 24 pin chip (U10) and the other is a hybrid 24 pin module (U8). These are to be installed into the corresponding sockets on the 1050's Printed Circuit Board (PCB). Atari is currently selling 1050s with two different types of U10 chips. The replacement U10 supplied by ICD, is the most common type found. If it is the wrong type for your drive, you can either move two jumpers (which requires soldering), or send us your ICD - U10 for an exchange with the other type (recommended).

Before Installing

Be sure to fill out your warranty/upgrade card and mail it in. This will qualify you for a free subscription to our OPEN FILE newsletter. It is also the only way we will be able to notify you of changes and updates, and the only way you will be eligible for upgrades. Please, take the time to fill in your Atari dealer's name and address, so we can make him aware of our products for the Atari.

If after reading these instructions you feel this installation is not for you, then talk to your local dealer or service center about it, or send us the drive. ICD will install this product for \$15.00 including UPS ground shipping one way. This low price is good only before you attempt to install the US Doubler. For later services, see our prices at the end of this chapter. For installation by ICD, send and mark the box to:

ICD, Inc.
1220 Rock Street
Rockford, IL 61101-1437

Attn: 1050 Install

Please include a check for \$15.00, the complete drive less cable and power supply, and the ICD product. Our turn-around is generally 48 hours.

Do You Still Want to Install It?

Tools Needed:

#2 Phillips head screwdriver

#1 Phillips head screwdriver (for some drives made in Hong Kong)

Medium or small flat blade screwdriver

A permanent ink marking pen for marking connectors during disassembly

An empty dish for holding parts

A clean well-lighted work surface

Small needle nose pliers

20-35 watt *small* tipped soldering iron (optional)

Let's Get Started!

Cover Removal

Turn the 1050 on its back and remove the 6 Phillips head screws. (4 are recessed and 2 are on the front bezel.) Place the screws into your parts dish.

Carefully turn the drive back onto its feet and set it down. Lift the rear of the top cover about 1/2 inch, slide it towards the front and lift the cover and bezel off as one piece. Set these aside.

Things To Look For

Notice how the drive assembly sits in the case and note the four black rubber washers under the drive frame. These usually fall out when removing the drive. (Hong Kong drives have these glued down.) On the early 1050 drives, there are also four steel pins at the center of these washers which fall out during disassembly (they are glued in on the later drives). Notice the wires which connect the drive to its PCB towards the rear. These should all be marked with J14, J10, etc. on the connectors. The markings correspond with the markings on the PCB but they don't always indicate the proper polarity. Take your marker and draw a line across the inside of each connector. We will then know when we plug them back in that the side with the black line goes towards the center. Do the same on all other connectors (there is one under the front of the drive frame). We are now ready for the heavy work.

Important: Some Hong Kong drives have connectors with no markings and color coded wires. If this is your situation you will need to make a chart indicating the color pattern for each connector if you unplug them.

Dealer Information

If you are selling or installing a large number of US Doublers, you may want to carry extra parts in inventory to help your customers. ICD U10s and adaptor sockets are available (direct from ICD only) to stocking dealers.

Here Goes Nothing . . .

Remove the Drive (optional)

Experience has shown that more problems are usually created by unplugging the drive from the circuit board than are prevented. The recommended procedure is to leave the drive mechanism connected to the circuit board and to lift it up to access the board.

Take care, though, as the wires are small and will break if too much stress is applied. You should still unplug J6, the drive head connector towards the front of the PCB. Notice that the red conductor on J6 goes towards the front of the drive. If you choose to leave the rest of the drive wires plugged in (we do), then proceed to **Remove the PCB**, otherwise, read on.

If You Wish to Unplug the Drive from the PCB . . .

Carefully unplug all seven connectors while noting their positioning. *Don't* pull on the wires; *Do* pull on the plastic connectors. A small needle nose pliers can make this easier for tight fitting connectors. After removing the wires, lift the drive frame up and out of the case and set it aside. Put the four rubber spacers and the four steel pins (if they're loose) in your parts dish.

At Last the PCB!

Remove the Printed Circuit Board (PCB)

You are now looking at the PCB. The chips (ICs) to be replaced are under that large tin cover (shield) which is fastened on the foil side (the bottom side) of the PCB with twisted metal tabs. This shield was designed to reduce RFI (interference with TVs, radios, etc.). The PCB is held down to the case with either two plastic tabs (Singapore models), or four plastic tabs and three small Phillips head screws with three brown insulating washers (Hong Kong models). If you have screws holding the board down, remove these first. Then, lift the front of the PCB while bending back the tabs with your other hand or screwdriver. The PCB needs to go slightly towards the front and then out of the case! Place the PCB with its component side down on your work area. (If the drive is still attached to the PCB you begin your balancing act.)

Remove the Metal Shield

The bottom shield on the foil side of the PCB is symmetrical but the top shield has a notched out area in one corner. This notch is for clearance of the soldered connections on components R43 and U14. Straighten the tabs and remove the two shields. Turn the PCB over, component side up, and get ready for fun. (If the drive is attached, you should lift it off the board with one hand while working with the other.)

Remove the Old ICs

The two 24 pin ICs, U8 and U10, must be removed. Use the flat bladed screwdriver and gently pry the chips out of their sockets and set them aside. These two will not be used again.

Check the Jumpers!

This is the **most important installation step** where most mistakes are made, so pay attention! JP1 through JP7 are the jumper wires behind U10 (See diagram). In most installations, only some of the JP (jumper) numbers will be visible. The other numbers are usually hidden under the jumpers themselves. These jumpers might be solid pieces of wire soldered between two pads, a wire with a white ceramic covering around the center or they might look just like resistors with black stripes. It does not matter which type is installed; they all serve the same purpose. The position of the first four jumpers (JP1-JP4) determines which type of U10 chip you will need. We're not really sure why Atari used the jumper system when the 1050 drive was designed. Maybe it was so they could switch chip types when one became more cost effective. There are many manufacturers of both types of chips and each works as well as the other for this application. The only difference is pin configuration, which is what the jumpers change.

If the replacement U10 does **not** have a label, JP2 and JP4 should be open (no connection); JP1 and JP3 should be closed (jumped). If the replacement U10 **has** a paper label on it, then JP1 and JP3 should be open (no connection) and JP2 and JP4 should be closed (jumped). Every effort has been made by ICD to provide you with the most common type of U10 chip.

We have found that most drives 'Made in Singapore' need the U10 without the paper label and most 'Made in Hong Kong' need the U10 with the label. The U10 which comes with the drive will match the corresponding ICD U10 needed.

If your replacement U10 is of the wrong type, you have two options:

- 1) Send us the ICD U10 (in protective packing) along with \$1.00 for shipping and handling and mark on the outside 'Attn: U10'. When we receive this, we will send the other type of U10 which you can then plug in. (If the pins are damaged on the returned IC, you will be charged \$7.00.)

- 2) Move the jumpers to their correct locations for the ICD U10 chip in your possession. Do not attempt this modification unless you feel confident with a soldering iron. Foil trace damage may result from sloppy de-soldering techniques which will result in a non-operational drive. The other jumpers JP5 through JP7 should always remain unmoved.

Plug in the Chips

For correct positioning, the notches at the ends of the modules (chips) go towards the front of the drive. Also, as a general rule, any labels or writing on your ICD replacement chips will read from the front of the drive to the rear. Carefully plug the new U8 (the larger module) into the socket for U8. Next, carefully plug the new U10 into its socket with the notch towards the front of the PCB. Make sure all the pins went into the correct holes in the sockets and are plugged in firmly. Wasn't that easy?

A number of drives from Singapore have been discovered with "defective" sockets in the U8 position. These can be identified by the numbers "41000" and "MXS-nn" molded into the plastic (where "nn" represents a number like 12, 9, 15, etc.). These sockets have large ridges which hold the ICD U8 module out of the socket and prevent proper pin contact. The U8 module will feel loose in the socket. If you find yourself with one of these sockets it is recommended that you send \$4.00 in an envelope addressed to ICD, Inc. Attn: U8 Socket. We will send a special socket adaptor which will allow simple installation. The only other alternative is to replace the socket (which means de-soldering and possible damage).

NOTE: This adaptor socket is *not* needed with the majority of Singapore drives nor with any of the Hong Kong drives.

REASSEMBLY

Put the Shield Back On

If you're unsure of what you are doing then you might want to leave the metal shield off for testing. If you haven't had any problems following us so far then it's all down hill from here. Be careful installing the shield and make sure the notched end of the top piece is over R43 and U14. Also, make sure that no components or wires are pinched between the shield and the PCB.

Put the PCB Back into the Case

Place the rear in first, then lower the front of the PCB. The PCB should easily snap in place under the plastic tabs. (Install the three washers and screws if your drive had them.)

Reinstall the Rubber Washers and Steel Pins (if removed)

Press the four rubber washers with the recessed side down, onto the plastic posts in the front half of the drive's case. The four steel pins are either still stuck in the plastic posts or, if they were loose (older drives), in your parts dish. Put one into each hole at the center of the rubber washers.

Reinstall the Drive Frame

Plug the connector from the drive head onto J6 at the front of the PCB. Carefully lower the drive frame onto the steel pins noting that the steel pins fit into holes in the drive frame.

Plug in the Connectors (if unplugged)

Plug the rest of the connectors onto the corresponding pin locations. Be sure to note the marking you made on the connectors during disassembly. (If you did not unplug your drive from the PCB, you can skip this instruction. That's your reward for being so brave and talented.)

Replace the Top Cover

To replace the top cover, line up the bezel over the front of the drive frame, then lower the cover. If the bezel becomes separated, put the top cover on first, then hook the top of the bezel under the top cover front edge, and gently snap it down into place. While holding the case together turn the disk drive upside down and lay it on its back. Screw the six Phillips screws back into place and presto!

Your Done!

START-UP AND TESTING

Plug the drive back into your system. If you're going to use UltraSpeed (US), it is usually best to make this drive number one. Put a SpartaDOS Master disk into the drive, close the door, and power up the computer. If you get an error message 'not an XL/XE computer', use the other Master disk. Impressed? The MASTER SpartaDOS diskettes are single density US format. The first few sectors are read at normal speed upon boot; the software determines whether the drive can handle UltraSpeed and then loads the high speed code into your computer. Even though double density sounds slightly slower than single density, the double density US format is even faster since it is working with larger sectors. Refer to the SpartaDOS manual for more information about operation and formats.

If it Doesn't Work

Go over the instructions again and check your work. There is probably something you have overlooked. All of our products are thoroughly tested *before* shipping to ensure high reliability. If the U8 module is in backwards or not making a good connection, if the jumpers are in the wrong position or if the traces were damaged during de-soldering, the power light will come on but the drive will not spin. You can use the new U8 with your old U10 but not visa versa. If your drive won't boot the master DOS disk then try a standard boot disk of known quality. If you still can't get it to work, send your complete drive to us for repair.

Our service turn around time is generally 48 hours. If there is a problem with our parts, there will be no charges. If there is a problem with your installation, you will be charged a \$25.00 flat rate including shipping. If there is a problem with the drive itself, our standard service rate is \$40.00 plus parts and shipping. In any case, we will send the repaired drive back to you via UPS COD or prepaid if you include your VISA/MASTERCARD number. For repairs, send the drive and mark the box to:

ICD, Inc.
1220 Rock Street
Rockford, IL 61101-1437

Attn: 1050 Service

Warranty

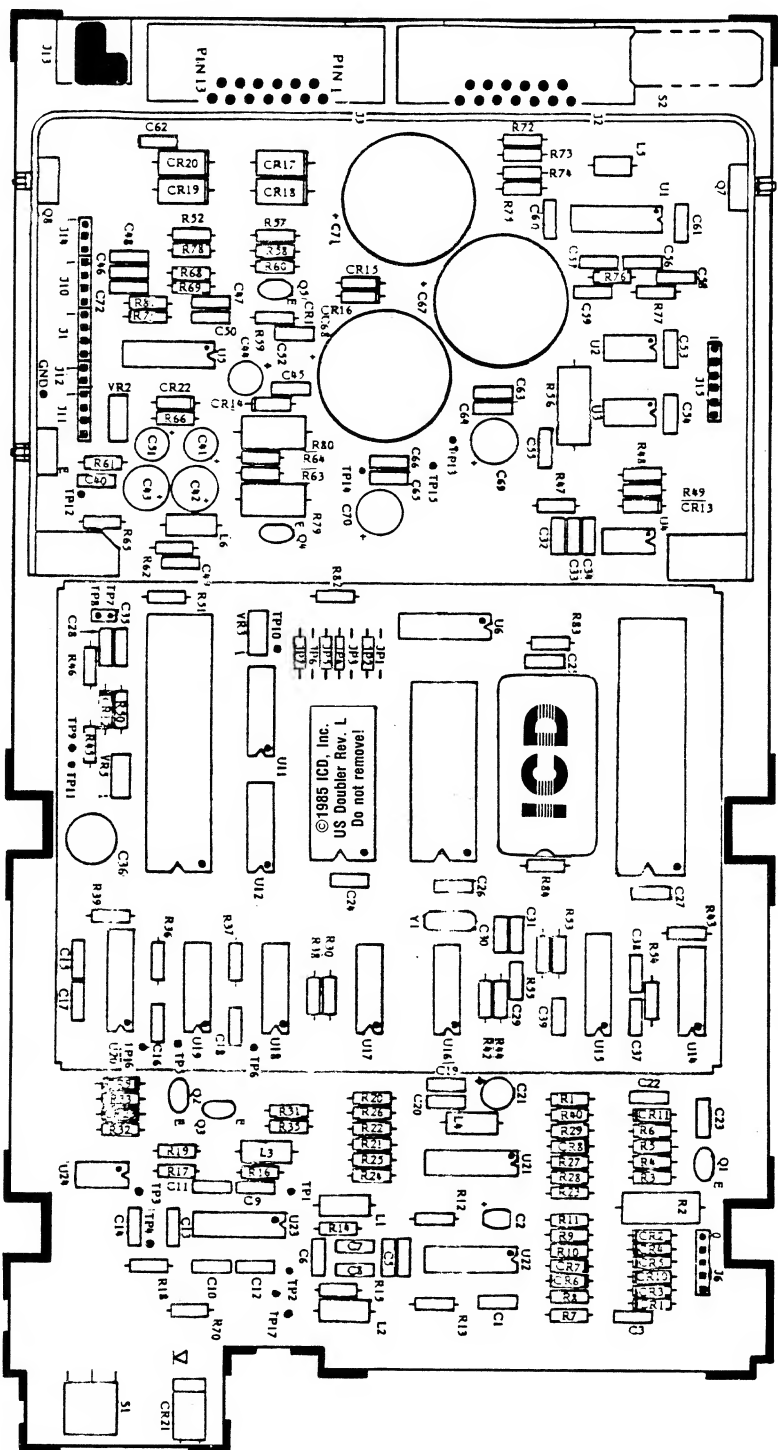
Be sure to completely fill out and return your warranty card. This is the only way you will be eligible for future updates or enhancements. The warranty is not transferable and is intended for you as the end user only.

Warning! The warranty will be considered null and void if the copyright labels are removed from the ICs or if the hybrid module has been tampered with. We do **not** support 'pirates' (a nice word for thieves dealing in computer software and hardware; we use other words). We own the copyrights for all of our products including SpartaDOS. Any users who are found to be selling or giving away copies of our products forfeit all rights to any support or service. Furthermore, we **will** take legal action against those users if we feel it necessary or justified.

SPECIAL CONSIDERATIONS

Format

Though the US Doubler is optimized for operation with SpartaDOS, any 'Atari Compatible' DOS should function with it properly. When changing from SpartaDOS to another brand of DOS and using the format command, first turn the drive power off and then back on (cold start) to re-initialize the internal format settings. Failure to do this could create format errors with the other DOS.





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LIMITED 30 DAY WARRANTY

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Write to:

ICD, Inc.
1220 Rock Street
Rockford, IL 61101-1437
Attn: Service Dept.

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Please take the time to complete this card and return it to us to allow us to provide you with more efficient service, including updates, should your **ICD, Inc.** product require it.

(Please print)

Name _____

Address _____

City _____ State _____

Country _____ ZIP _____

Phone () _____ Item Purchased _____
(Area Code)

Date of Purchase _____ Serial Number _____

Where Purchased _____

What other products would you like to see us develop? _____

Does your local Atari dealer carry our product line? ☐ Yes ☐ No

Your Atari dealer's name, address _____

USD 1-4
012065

PLACE
STAMP
HERE

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1220 Rock Street
Rockford, Illinois 61101-1437



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